

## CLAIMS:

1. Data representation apparatus for representing data by means of an audio signal, comprising

- an audio processing unit arranged to deliver the audio signal with a characteristic dependent upon a positionless data variable capable of having a first value and a second value,  
5 characterized in that

- the data representation apparatus comprises a mapping unit, arranged to map the first value of the data variable to a first position in three-dimensional space, and the second value of the data variable to a second position in three-dimensional space; and

10 - the audio processing unit is arranged to change the characteristic, resulting in the audio signal appearing to originate from the first position for the data variable having the first value respectively the second position for the data variable having the second value, to a user listening to the audio signal.

15 2. Data representation apparatus as claimed in claim 1, wherein the audio processing unit comprises a filter for applying a head related transfer functions to an input audio signal to obtain the output audio signal appearing to originate from the first position respectively the second position.

20 3. Data representation apparatus as claimed in claim 1, comprising a data variable distributor, capable of delivering the data variable derivable from a measurement from a measurement device to the audio processing unit.

25 4. Data representation apparatus as claimed in claim 1, wherein the mapping unit is arranged to map a collection of nominal values of the data variable to predetermined regions of three-dimensional space.

5. Data representation apparatus as claimed in claim 1, wherein the mapping unit is arranged to map a collection of numerical values of the data variable to positions on a curvilinear locus in three-dimensional space.

5 6. Data representation apparatus as claimed in claim 1, wherein specification means are comprised, arranged to allow a specification of a preferred mapping for the mapping unit.

7. Data representation apparatus as claimed in claim 1, wherein selection means  
10 are present, arranged to allow presentation of a first set of data variable values by a first type of the audio signal and a second set of data variable values by a second type of the audio signal.

8. A system for representing data by means of an audio signal, comprising:  
15 - an audio source arranged to deliver an input audio signal;  
- a source of a data variable capable of having a first value and a second value;  
- a sound production device; and  
- a data representation apparatus for representing data by means of the audio signal, the data representation apparatus comprising  
20 an audio processing unit arranged to deliver the audio signal to the sound production device with a characteristic dependent on the data variable,  
characterized in that  
- the data representation apparatus further comprises a mapping unit, arranged to map by means of a mapping the first value of the data variable to a first position in three-  
25 dimensional space, and the second value of the data variable to a second position in three-dimensional space; and  
- the audio processing unit is arranged to change the characteristic, resulting in the audio signal appearing to originate from the first position for the data variable having the first value respectively the second position for the data variable having the second value, to a  
30 user listening to the audio signal.

9. A method of representing data by means of an audio signal, comprising an audio processing step delivering the audio signal with a characteristic dependent on a data variable, capable of having a first value and a second value,

characterized in that

- a mapping is effected mapping the first value of the data variable to a first position in three-dimensional space, and the second value of the data variable to a second position in three-dimensional space; and

- 5 - the audio processing step changes the characteristic, resulting in the audio signal appearing to originate from the first position for the data variable having the first value respectively the second position for the data variable having the second value, to a user listening to the audio signal.

- 10 10. A computer program for execution by a processor, enabling the processor to execute the method of claim 9.

11. A data carrier storing the computer program of claim 10.